

Insects



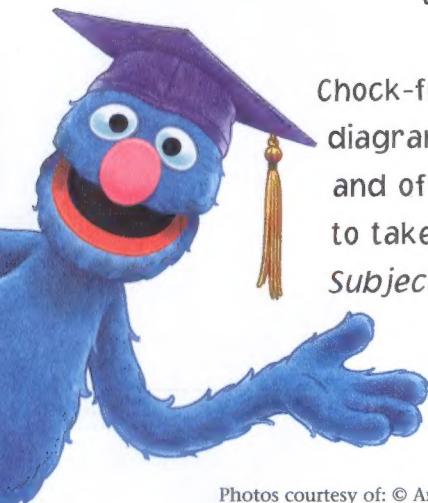


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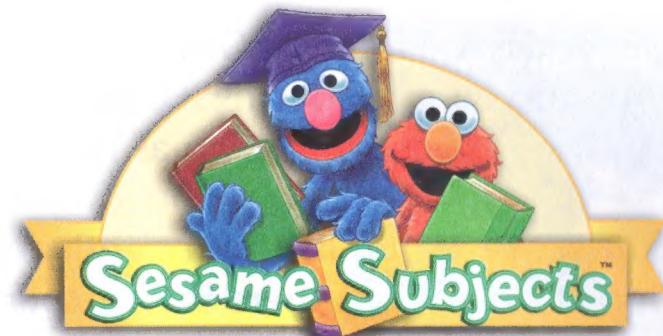
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Printed in the U.S.A.

CE14559/1112



**My First Book About
Insects**

By Kama Einhorn
Illustrated by Christopher Moroney

Dalmatian Press

Hello, everybuggie! Today I, Professor Grover, and my friend Elmo are going to teach you all about INSECTS. The study of creepy-crawly creatures—otherwise known as insects—is called entomology.

But first things first. We would like to remind you that you should touch an insect only when there is a teacher or another adult with you. Be sure to treat the insects you touch gently—don't bug the bugs!



Now, in this book, you will meet some insects face to face. See?

Our Twiddlebug friends are cousins to insects, so they are really the experts. And our friend Oscar *looooves* bugs. They like to buzz around his beautiful can. Oscar just adores bugs that bug him.

sandhill hornet

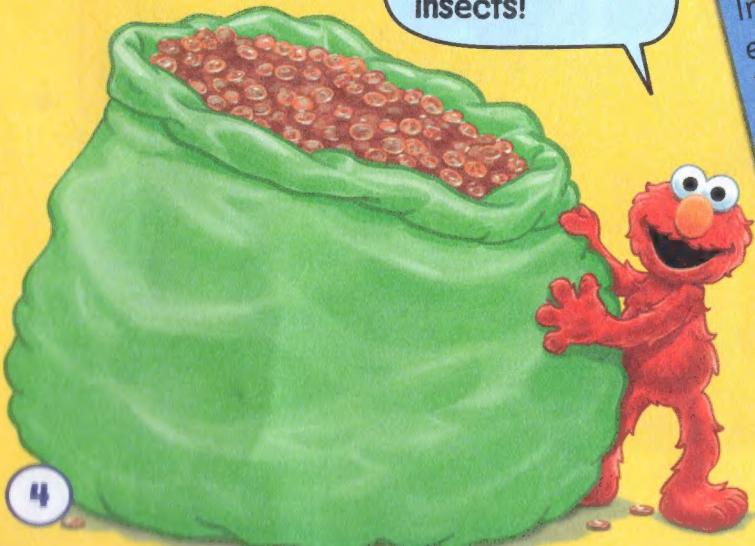


Insects come in many, many different shapes, sizes, and colors.

There are at least 1 million different kinds of insects.

Here's a way to think about how big a million is. Imagine that ten kids each collected 1,000 pennies (that's ten dollars in pennies) every day for the first 100 days of school. You would end up with a million pennies. If you put them into a huge bag, no person could lift the bag!

Wow, that's a lot of different insects!



twelve-spotted skimmer



honeybee



pond skater



Insects may look very different from each other, but adult insects are all the same in three ways:

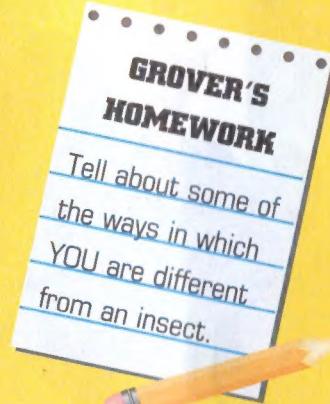
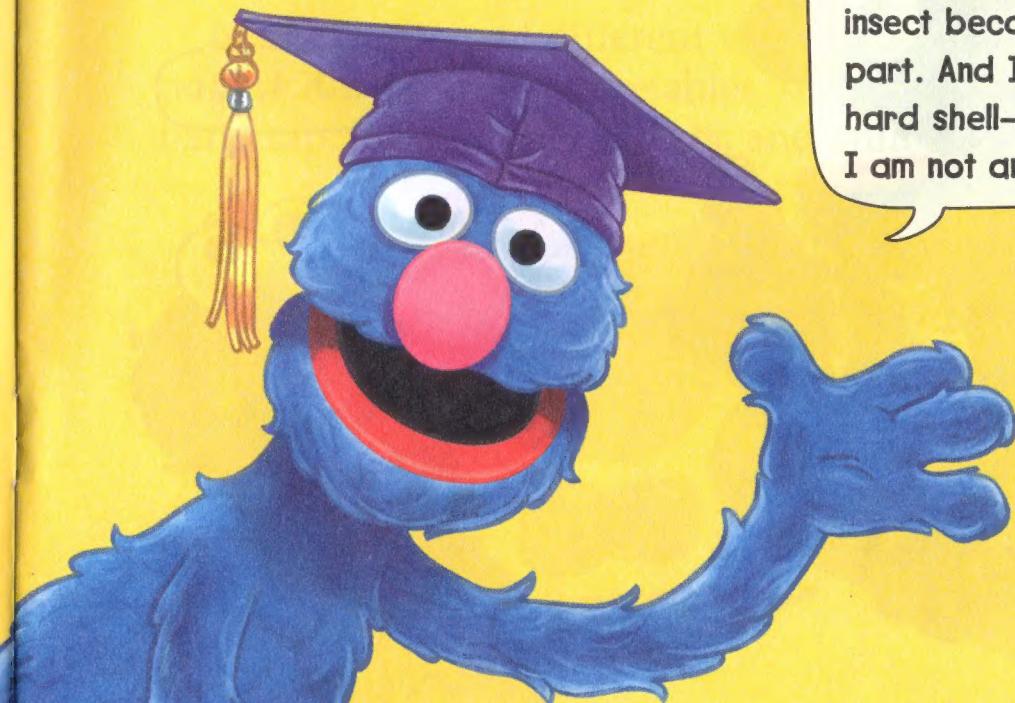
1. All have six legs.
2. All have three main body parts: **head**, **thorax** (the middle section), and **abdomen** (the belly).
3. All adult insects' bodies are covered in a hard shell called an **exoskeleton**.

rhinoceros beetle

head thorax



So, a spider is not an insect because it has eight legs. A worm is not an insect because it has only one body part. And I, Grover, do not have a hard shell—just soft, smooth fur. So I am not an insect.



**TWIDDLEBUG
TRIVIA**



Ants use their legs to walk long distances looking for food.

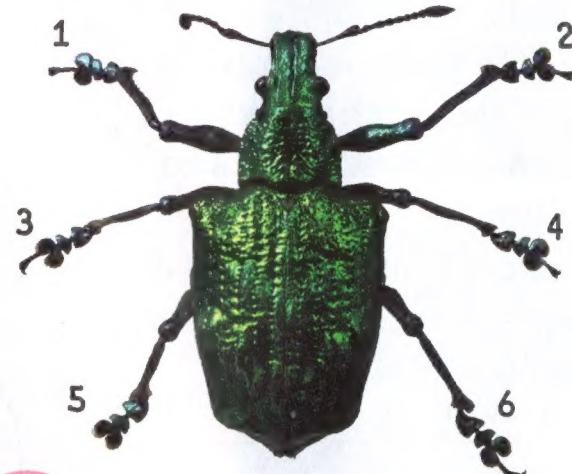
Grasshoppers and katydids rub their legs against their wings to make music! They do this to help them find a mate.

Flies' feet have special pads that stick to almost anything, so they can explore places that other insects can't.

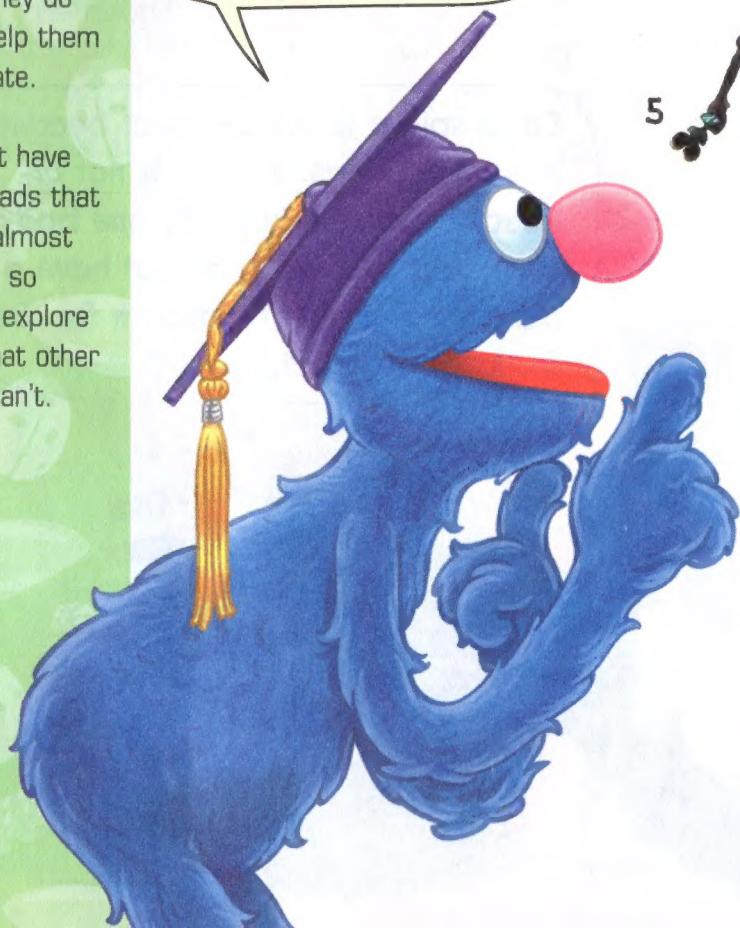
All insects have six legs.

An insect uses its legs to walk, run, swim, jump, or dig.

metallic green weevil



Shall we count the legs on this insect? Yes, we shall! Point to each leg and count with us.



1, 2, 3, 4, 5, 6.



All insects have three main body parts: head, thorax, and abdomen.



TWIDDLEBUG TRIVIA

Insects that hunt like dragonflies and flies, have big eyes that are made up of thousands of tiny eyes. These are called compound eyes. They help the insect see in many directions at the same time.

An insect's eyes, mouth, and antennae are located on its **head**.

The insect's legs (and wings, if the insect has them) are attached to its middle part, the **thorax**.

The **abdomen**, or belly, is where food is digested and eggs are made.



Insects eat lots of different things, including leaves, pollen, nectar, fruits, vegetables, seeds, wood, fabrics, bark, sap, blood, other insects, and animals.



Some insects can see more colors than people can.

All insects have exoskeletons, which means their skeletons are on the outside, not the inside.

Instead of having hard bones inside their bodies like people do, insects have hard shells that protect them.

flower beetle



This beetle has a shiny green exoskeleton.

a cicada molting



club-tailed dragonfly



Insects breathe through their exoskeletons.

earwig



When an insect grows, its exoskeleton sheds, or falls off. Then a new, larger exoskeleton underneath can grow. This shedding is called molting.

Most insects have antennae on their heads.

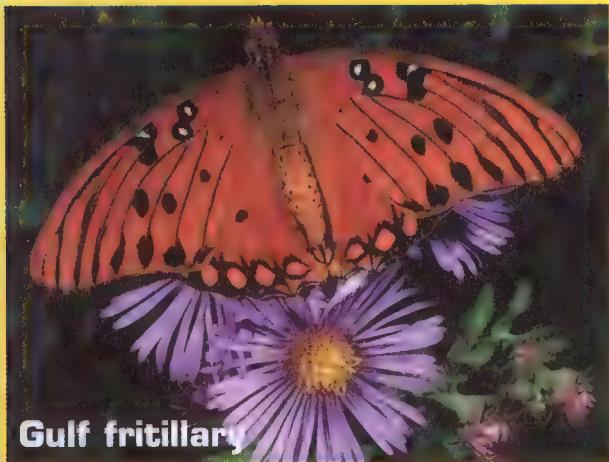
Antennae, or feelers, are a little like hands. They help the insect feel its way around and find food.

Insects don't have noses, so they smell with their antennae. Antennae help insects touch and taste, too.



Most insects have wings.

Wings help insects fly. Flying helps insects escape danger, find food, and find places to live. Wings can be all different sizes, shapes, colors, and patterns.



Gulf fritillary



blue morpho



scarlet swallowtail butterfly

Many butterflies and some moths have big, beautiful wings.



bumblebee

TWIDDLEBUG TRIVIA

Insects were the first creatures to fly, millions of years before birds and dinosaurs.



whitetail dragonfly

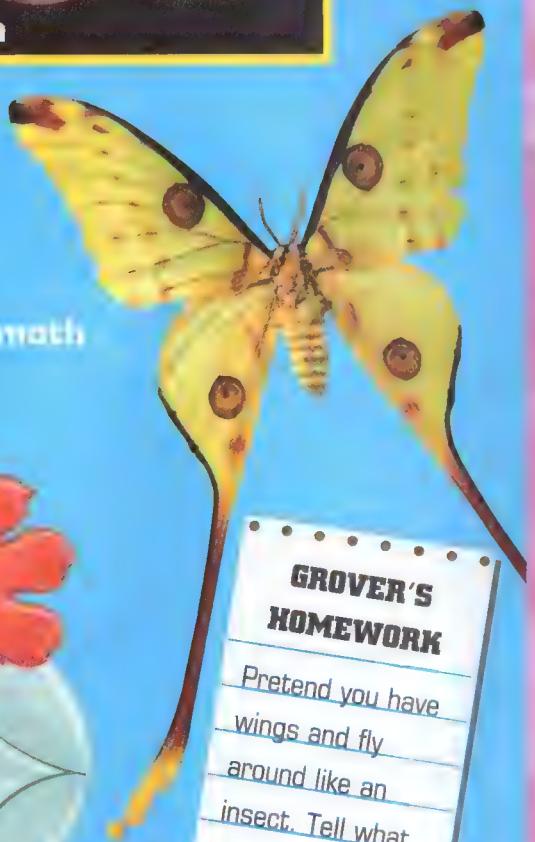


Io moth



A dragonfly's wings move so fast when it flies that you can hardly see the wings moving.

comet moth



GROVER'S HOMEWORK

Pretend you have wings and fly around like an insect. Tell what you would be able to do differently if you had wings like a bug.

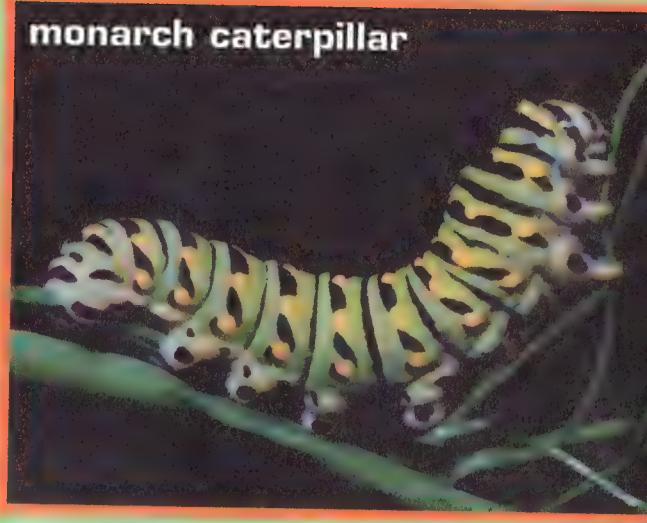


Some baby insects become grown-up insects in special ways.

When butterflies are born, they don't look anything like butterflies. Instead they hatch from eggs as caterpillars. They eat and EAT to get ready for their next big change. Then they stop moving, and their skin falls away to reveal a special hard case called a **pupa** (say PYOO-puh). The pupa is also called a **chrysalis** (say KRIS-uh-lus). (A moth pupa is called a cocoon.) The chrysalis protects them as they change even more. When they break out of the chrysalis, they are butterflies with big, gorgeous wings!



monarch caterpillar



monarch pupa

monarch butterfly





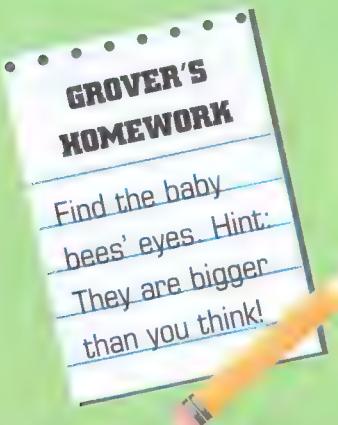
TWIDDLEBUG TRIVIA

Baby mosquitoes are called wrigglers. They live in puddles.

Baby dragonflies (called nymphs) live in water, and some of them eat small fish.

Bees that take care of baby bees are called nurses.

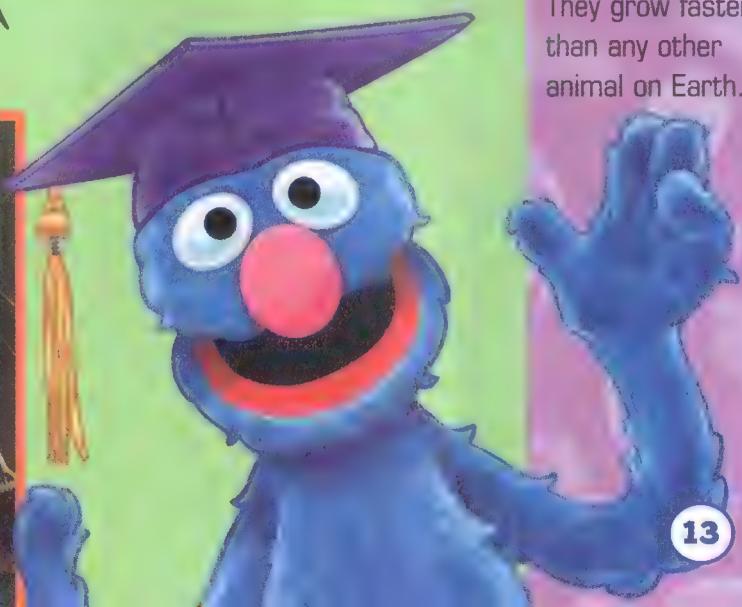
Caterpillars are eating machines! They grow faster than any other animal on Earth.



Look carefully at this praying mantis's egg case. There are hundreds of eggs inside (one baby to an egg)! Can you believe it?



praying mantis and egg case



Some insects can be harmful to plants, animals, and people.

Termites eat wood and can ruin trees and homes. Bees and wasps can sting. Mosquitoes, flies, and fleas can spread germs that make people and animals sick. And some moths like to eat clothes made from sheep's wool.

Some insects eat plants that people grow for food. Locust swarms can be made up of millions of locusts that travel together to eat crops. There are so many that they can look like a big black cloud.

This moth-eaten sweater
happens to be my very
favorite. Isn't it beautiful?!

locust swarm



But insects do important work for the Earth, too.

Some plants need pollen to make seeds. Bees and butterflies carry pollen from one plant to another. Without the pollen carried by insects, fruits and vegetables can't grow on trees and plants.

Ladybugs help protect plants by eating aphids. Aphids are smaller insects that can damage plants. Elmo knows a rhyme about a ladybug.

Ladybug, ladybug, turn around.
Ladybug, ladybug, touch the ground.
Ladybug, ladybug, read the news.
Ladybug, ladybug, shine your shoes!



honeybee



Bees make honey.
Honey is food for
the bees. But people
also eat honey.



Indybug

GROVER'S HOMEWORK

Dance like a bug
to Elmo's ladybug
rhyme!

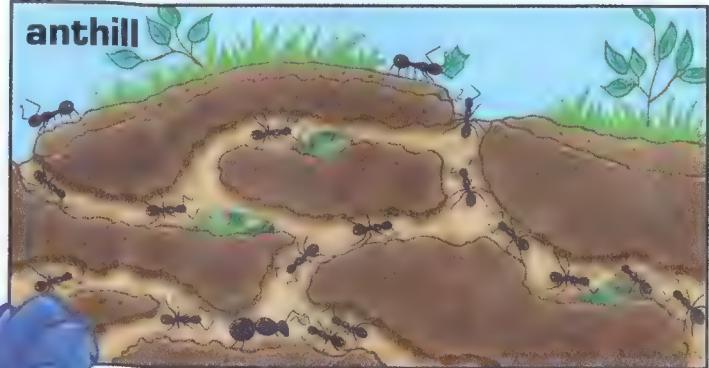
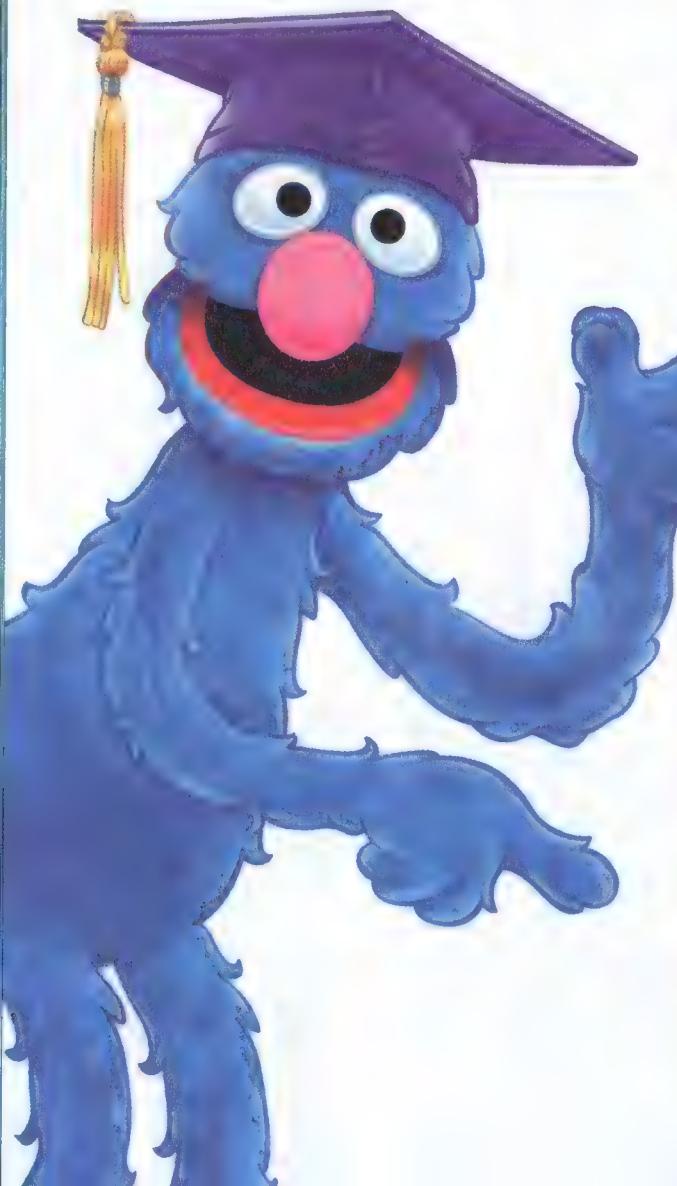
Ants and other
insects that dig help
to keep soil healthy
so plants can grow
in it.

tropical ants



Insects live in many different types of homes.

Some insects, such as ants and termites and many bees and wasps, live and work together in large groups called colonies. Each insect in the colony has a special job.





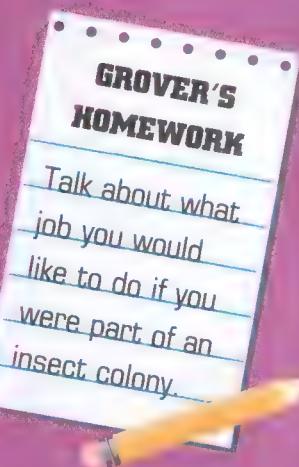
An **anthill**, a **termite mound**, or a **beehive** is like a little town or city! It has places where the insects live, where they store their food, and where baby insects are born.

Ants and termites build mounds. Bees and wasps build hives and nests.

Ant, termite, and bee colonies have a queen. The queen's job is to lay eggs while other members of the colony find food, build nests, or take care of the young.



In West Africa, termite colonies contain more termites than you could possibly count. Special "chimneys" bring fresh air into the colonies. A chimney is like a tube that lets air in and out.



Ants can lift and carry more than fifty times their own weight. So, if you weighed forty pounds, this would be the same as your carrying four grown gorillas, or fifty kids who weighed as much as you!

Honeybees do a special dance to show other honeybees where there is food.

Now you know a lot about insects. But here are some facts that will REALLY make you buzz with excitement!

Bats, birds, frogs, lizards, monkeys, and many other animals—including some people—eat insects. So, most insects have a way to protect themselves.



The green stick insect uses camouflage, which is a type of disguise, to fool its enemies by blending in with colors and objects nearby.



green stick insect

A stinkbug releases a bad smell, like a skunk, so it won't get eaten.



green stinkbug



Crickets rub their wings together to make a singing sound. Have you ever heard crickets sing?



TWIDDLEBUG TRIVIA

Insects lived on Earth even before dinosaurs, which was a very, very long time ago.

Fireflies, which are also called lightning bugs, have a back end that lights up!

A glowworm is a firefly larva (a baby firefly) or a grown-up female firefly.



Why do you think this insect is called a giraffe weevil?

For every person on Earth, there are 200 MILLION insects! Most countries in the world don't have anywhere near 200 million PEOPLE!

The feather-winged beetle is so small you can barely see it.

The longest insect is a giant stick insect. When its legs are stretched out, it is twenty inches long. That's about as long as a cat.

“EXTRA-CREDIT” FUN FOR EVERYONE!

Oh, you have learned so much. If you want to learn even more about our creepy-crawly friends, you can do these fun activities together with your family and friends:

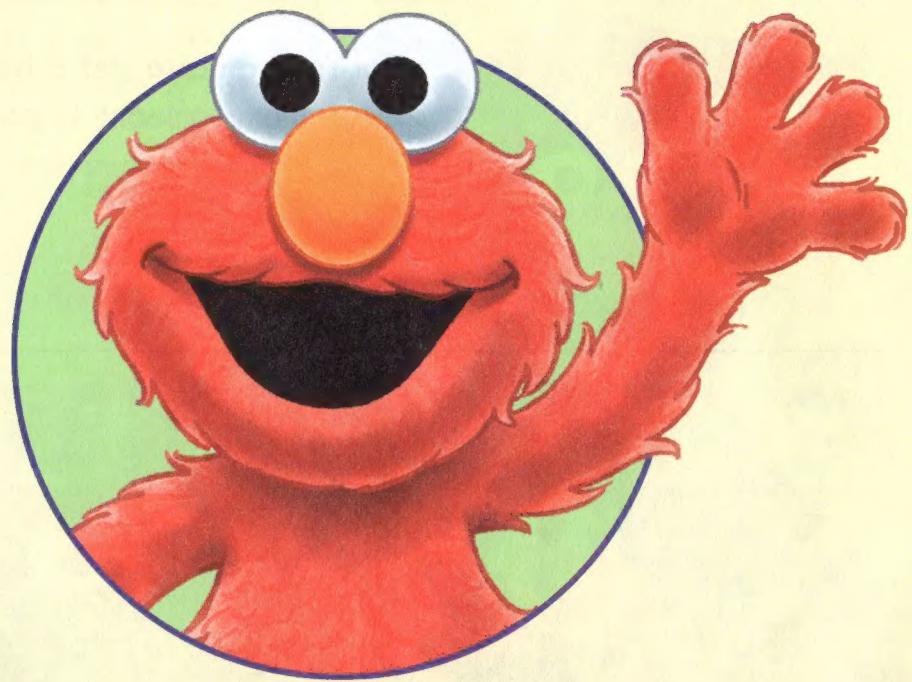
1. Be a bug explorer! Go outside with a magnifying glass. Use it to look closely at the ground, a plant, or a tree. Chances are you will see an insect! Keep a bug journal and draw pictures of all the insects that you find.
2. Start your own bug club! With your friends, pick different bugs to learn about, and ask a grown-up to help you search for insect information on the Internet or at the library. Cut out pictures of insects from magazines and see what you can find out about them.
3. You can make a beautiful butterfly to keep in your home. Fold a piece of paper in half and cut a shape like this. Open it and put paint blobs on one half. Then fold it, press it, and unfold. Your butterfly has the same lovely design and colors on both sides! Just be sure to let it dry before you play with it. Then fly around and flutter by with your butterfly.

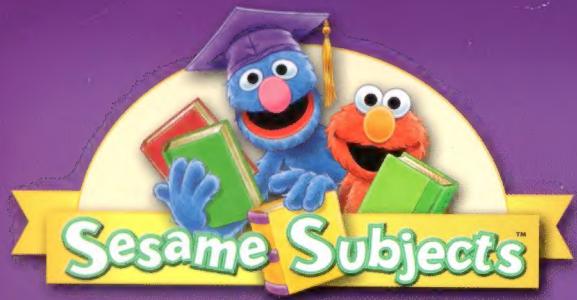




4. Bees do a waggle dance to let other bees know where to find food and nectar. Create your own dance that gives a message or tells a story. Have your friends and family try to guess what you are trying to tell them.







Hello,
everybuggie!



Insects

Insects come in many different shapes, sizes, and colors.



For all ages

CL 38686 11/12



Dalmatian Press

Visit us at funpup.com

113 Seaboard Lane
Franklin, TN 37067
1-866-418-2572

Printed in Ft. Wayne, IN, U.S.A.

ISBN 1-4530-0873-X



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CE14539/1112